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## STATE ROUTE 206 FREEWAY

Staff Report

March, 1957

NOTE: This Report has been prepared by the Berkeley Planning Department as a basis for discussion with the Planning Commission, other official agencies, and citizen groups. It has not been approved by these agencies or groups.



## STATE ROUTE 206 FREEWAY

### SUMMARY HIGHLIGHTS

#### CART 1

1. The purpose of this report is to provide a basis for citizen participation in policy with respect to a State Route 206 Freeway. (page 10)
2. The Berkeley Master Plan, adopted by the City Council in 1955 after considerable public discussion, recognizes that a freeway in the general vicinity of State Route 206 has necessarily and substantially adverse effects. A recommendation will be made by the Planning Commission when more complete engineering and cost data are available. (page 9)
3. According to State Highway Engineers a State Route 206 Freeway is an integral part of the East Bay Freeway network. Its principal purpose is to facilitate traffic moving between Berkeley and northern points on the San Leandro Creek corridor, Oakland and South San Francisco County. (page 15)
4. Traffic volumes on Adeline Avenue, Tolman Road have been increasing considerably. State estimates of future traffic demand must recognize regional traffic transversality and take that only a freeway type construction will accommodate the potential demand. (page 15)
5. The proportion of traffic on State Route 206 is considered to be going up rapidly. Only 10% of the traffic now entering Berkeley via State Route 206 comes from the northern part of the city. In about 10 years, the State Route 206 population will be nearly 50% of the total population of Berkeley. (page 15)

STATE ROUTE 206 FREEWAY  
SUMMARY HIGHLIGHTS  
CART 1

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1. **CHANGES IN THE NUMBER OF FOLIAGE AND DIFFERENT TYPES**: Based on the 2001 data, the  
2. main problem of forest Pines was foliation decline. The frequency of the incidence of  
3. foliation decline in pine forests in the study area reached 100% in October 2001. The  
4. most severe damage was observed in the maximized number of pine forests (100%).  
5. The following table shows the results of the survey of pine forests in the study area.  
6. (Table 1) (Table 1)

- (b) Any State's recommendation(s) should be thoroughly evaluated by the New Planning Commission, and appropriate recommendations made in the 1973 "Policy" study concerning the need for state participation in the development of a state park system. In fact, the State's responsibilities should be clearly delineated by the new Commission, and a
- (c) Policies for dealing with the problem of the economic impact of the problem area should be developed by the new Commission, and a plan of sound development of existing facilities, and the development of other facilities (e.g., 714) should be agreed upon.

## THE STATE ROUTE 206 FREEWAY

### PART I

#### INTRODUCTION

##### History of the Problem:

The question of the desirability and location of a freeway along State Route 206 (the so-called 'Ashby Freeway') has been debated by Berkeley citizens and their government for nearly twenty years. A complete history of the problem was recently compiled by the Berkeley City Manager <sup>1/</sup>, and a brief summary of this history follows:

- • • In the mid-1930's the route became part of the State Highway system.
- • • In the mid-1940's Berkeley Civic Groups and the City government considered improvements to the route which would have made it a six-lane parkway.
- • • In 1947 the State Division of Highways completed a traffic forecast that indicated only a freeway-type facility would accommodate expected traffic volumes on State Route 206.
- • • During 1948-51 the Berkeley Department of Public Works studied possible freeway routes and completed a report <sup>2/</sup> outlining five alternate routes.
- • • In April, 1952 the Berkeley Planning Commission recommended that a sixth route, lying farther to the south than those proposed by the Public Works Department, be given further study. <sup>3/</sup>
- • • On April 22, 1952, the City Council conducted a public hearing attended by 2000 persons. Four petitions, bearing 4997 signatures, were presented in opposition to any freeway in South Berkeley. The Council adopted a Resolution <sup>4/</sup> stating that no route was endorsed, and that further studies should be made by a Citizens Advisory Committee and the affected cities.

<sup>1/</sup>John D. Phillips, City Manager Report No. 347, April 26, 1956

<sup>2/</sup>Richard Gallagher, Director of Public Works, Berkeley, Crosstown Freeway Study, Jan. 8, 1952

<sup>3/</sup>Berkeley Planning Commission, Proposed Berkeley Freeway, State Route 206, April 3, 1952

<sup>4/</sup>Berkeley City Council, Resolution No. 33,599 N.S. April 22, 1952

Since 1952 the Berkeley Master Plan has been adopted, revised forecasts of traffic demands have been made available, the Regional Rapid Transit studies have been completed, but no further engineering studies have been made of the State Route 206 Freeway.

In the spring of 1956, several civic groups began further consideration of the freeway proposals and expressed their views to the City Council. At its April, 1956 meeting, the City Planning Commission adopted the following motion:

"It is the opinion of this Commission that the Ashby Freeway is a planning question and should be referred to the Planning Commission for a report and recommendation before action is taken by the City Council."

In accordance with this request, the City Council referred the matter to the Planning Commission for study and recommendation.

#### The Berkeley Master Plan

The Berkeley Master Plan,<sup>1/</sup> prepared by the Planning Commission and adopted by the City Council on April 12, 1955, "Sets forth proposals for a network of trafficways designed to serve Berkeley's needs and regional traffic needs insofar as they can be determined"<sup>2/</sup>. The Plan includes the following as one of six major problems of vehicular circulation in Berkeley...: "The lack of an adequate regional traffic route connecting Berkeley and the urban development to the north with the area east of the Berkeley Hills and East Oakland."<sup>3/</sup>

More specifically, the following statements are included in the description of Freeways in the Plan:<sup>4/</sup>

"STATE HIGHWAY ROUTE 206: This route is a part of the regional network of highways and serves traffic moving between Berkeley and more northerly points, and the Walnut Creek-Orinda Area, Oakland, and southern Alameda County. At present this traffic follows Ashby Avenue and Tunnel Road through Berkeley.

The exact future location of this freeway route is dependent upon several factors. Such factors include topography, acquisition costs for rights-of-way, the disruption of personal property, the disruption of neighborhoods, and of school and park service areas; and the origins and destinations of persons using the route. Several alternate locations for the freeway route in the general area of Ashby Avenue have been given preliminary study by the City. When more complete engineering and cost data are available, the Planning Commission will submit a firm recommendation to the City Council regarding

<sup>1/</sup> Berkeley City Council and Planning Commission, BERKELEY MASTER PLAN, 1955, revised 1956

<sup>2/</sup> ibid, page 62

<sup>3/</sup> ibid, page 66

<sup>4/</sup> ibid, pages 70-72

the design and location of this facility. For the purpose of the Master Plan, the dashed line on Plate 12 indicates that a freeway will run from the junction of Tunnel Road and Broadway to the East Shore Freeway at Ashby Avenue. Other trafficway routes across South Berkeley cannot finally be determined until a decision is reached as to the exact location of State Route 206.

When the submerged land along Berkeley's waterfront is developed, three Berkeley trafficways will provide direct access to the area. State Route 206 will be one of these trafficway connections and will have an overhead grade separation where it intersects with the East Shore Freeway."

Purpose and Scope of this Report

As stated in the Master Plan, it is the intent of the Planning Commission to make a firm recommendation to the City Council concerning the location of the State Route 206 Freeway when additional engineering and cost data are available. At the present time the needed data is not available, and no program has been established to make it available. Also, many citizens and civic groups in Berkeley have questioned the benefit of a freeway to Berkeley, and have opposed any route suggested and any further consideration of the idea.

This report is intended to provide a basis for clarifying City policy with respect to State Route 206, and to outline a specific program for action, if Berkeley confirms its Master Plan which states a freeway is necessary. The report attempts to provide a basis for answers to the following three questions:

- (1) Is a freeway in the general vicinity of State Route 206 desirable from Berkeley's viewpoint?
- (2) If so, what criteria should the City use in evaluating specific routes proposed?
- (3) If so, what procedure should be followed in the selection of a specific route?

**SHOULD STATE ROUTE 206 BE DEVELOPED AS A FREEWAY?**

Development of Freeways in California

Freeways are becoming such a common feature of California urban life that a general description is almost unnecessary. In summary, they are 4, 6, or 8 lane roads specifically designed to carry heavy volumes of traffic

safely, and at speeds ranging from 40 to 55 miles per hour. They may be elevated, depressed, or level with the ground, depending upon the topography and physical obstructions. Key streets are carried over or under the route, and no traffic lights are needed. Special safe lanes, or interchanges, are provided to get on or off the artery.

The effect of freeways has been to make travel quicker, safer, and cheaper for the motorist. Traffic engineers report that average speeds of 48 mph are typical for urban freeways, and 18 mph for city streets. The accident rate on California freeways is only 1.92 <sup>1/2</sup> fatalities per 100,000,000 vehicle miles, compared to 6.1 for the entire statewide travel on all streets <sup>2/</sup>. With regard to travel cost: freeways save from 1/4¢ to 1/2¢ per mile for passenger cars and up to 3 1/2¢ per mile for trucks, not including savings in time. <sup>3/</sup>

California has built nearly 1,000 miles of freeways in the last 10 years. In addition, about 300 miles are now under construction and an additional 900 miles are in the planning stage. Within the San Francisco and Los Angeles urban regions, extensive construction programs are underway which are designed to serve the flow of longer distance traffic. Plate I indicates freeway progress to date within the Bay Region. Freeways now constructed, budgeted, or planned will form a comprehensive network linking the settled parts of the Region.

### The East Bay Freeway Network

An Integrated System: Plate II is a more detailed map showing the location and status of each route in the East Bay Freeway network prepared by the State Division of Highways. The network is designed to carry the heaviest urban, interurban, and regional traffic volumes and connects the most important residential, industrial, cultural, and recreational centers. Each route plays a role in the complete system. For example, the functions of the East Shore Freeway include:

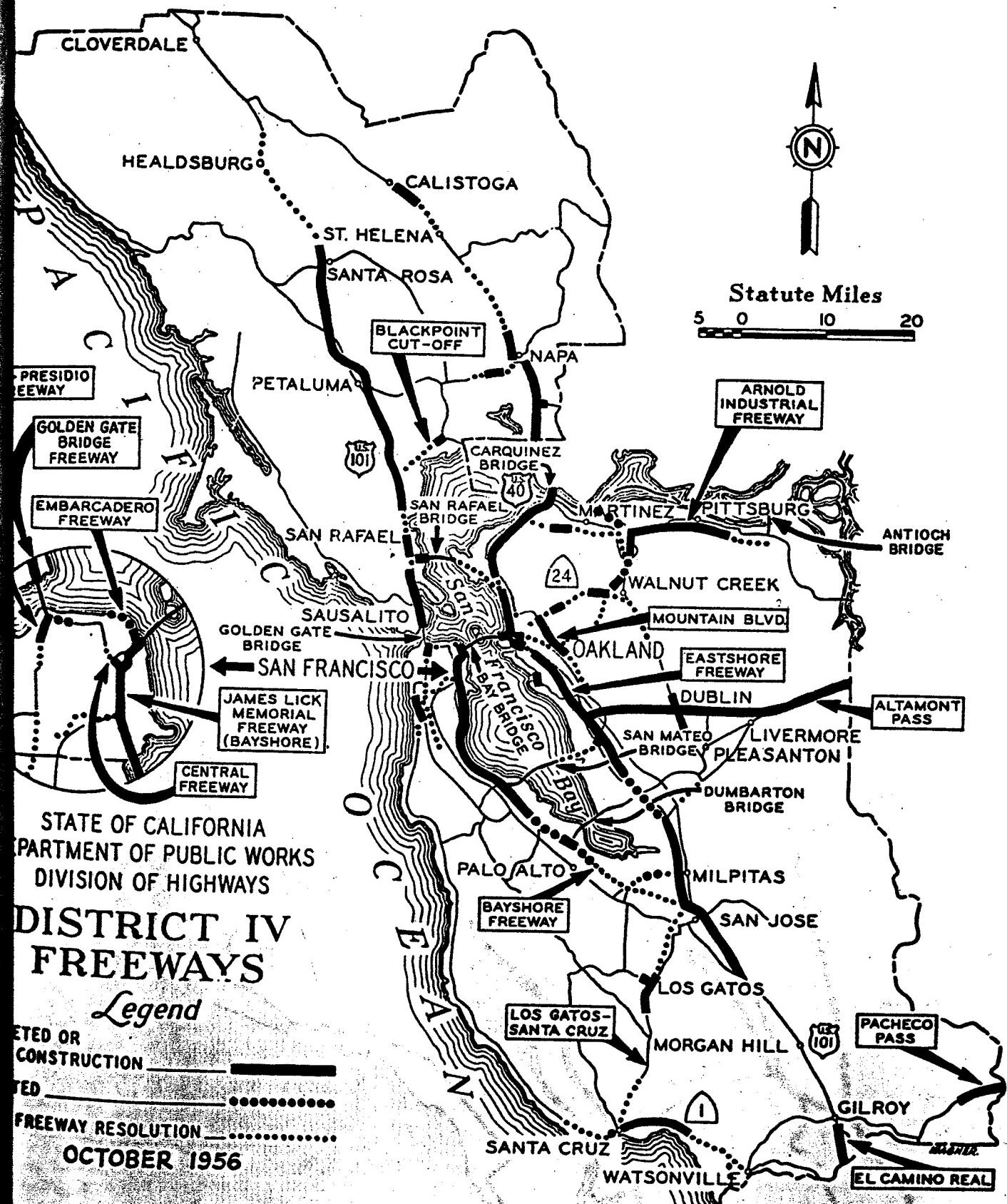
- (a) Interconnecting the urban centers of Richmond, Berkeley, Oakland, San Leandro, and Hayward;
- (b) Feeding Eastbay traffic to the Bay Bridge;
- (c) Providing direct access from workers and goods to the industrial districts skirting the shoreline; and
- (d) Providing direct connection to the outermost portions of the Bay area and the balance of the state.

1/ Figure quoted from newspaper statement by Frank Durkee, State Director of Public Works, 5/24/56

2/ For all roads in California, 1954

3/ Ralph A. Moyer, An Analysis of Highway User Benefits on the California Interstate System Resulting from Completion of a 10-Year Full Freeway Program, The Institute of Transportation and Traffic Engineering, University of California, Berkeley, Calif., May 1955, and State Division of Highways, PLANNING MANUAL OF INSTRUCTIONS, Part 8

# PLATE 1





Who would use the Freeway?

Questions have been raised from time to time about whether or not a freeway along State Route 206 would really serve Berkeley. Some people are under the impression that Ashby Avenue today serves only as a direct speedway from the Broadway Tunnel to the Eastshore Freeway. In an attempt to assemble factual information, the Berkeley Planning Department, in co-operation with the Traffic Engineering Division, made an analysis of the traffic along Ashby Avenue during the peak hour of a typical weekday morning (see Appendix A). In summary, the findings were that of all the westbound traffic entering Berkeley from Tunnel Road, only 16% of it drives directly to the Eastshore freeway; the other 84% turns off before it gets there. A great deal of the traffic (40%) turns north on Domingo Road or on Claremont Avenue, towards the University. (See Appendix A for further discussion)

The State Division of Highways states as follows:

"It is estimated that 60% of the total number of trips assigned to the route (in the estimate of 1980 traffic demand) have their origin or destination in Berkeley and of the traffic using the ramps in Berkeley approximately 70% will have their origin or destination in Berkeley with the remainder bound for outside of Berkeley." 1/

It would seem apparent, from these two sources of information, that State Route 206 is of great interest to those of us who live in or want to drive to Berkeley.

Relation to the Rapid Transit Proposals

The recently completed report on rapid transit 2/ concludes that both rapid transit and freeways are needed to satisfy the transportation needs of the Bay Area. The report states (page 37):

**"FIRST REQUIREMENT: A REGIONAL FREEWAY NETWORK**

The existence of the very large group, for whom only the private motor vehicle provides effective transportation, dictates a strong highway system as the very first requirement in satisfying overall transportation demand. Specifically, we consider that the known size of this group makes essential - as the first inter-urban transportation requirement - a regional arterial highway system of freeway-quality construction. Programming of such regional freeways in the Bay area is already well advanced, and the plans to carry these to completion must be strongly supported."

It is clear, upon examining the transit report, that construction of a

1/ B. W. Booker, Assistant State Highway Engineer, Division of Highways, District IV, in a letter dated June 13, 1956, sent to Jas. A. Barnes, Director of Planning, Berkeley, in reply to an inquiry.

2/ Parsons, Brinckerhoff, Hall and MacDonald, REGIONAL RAPID TRANSIT, San Francisco 1956

freeway along State Route 206 is part of the anticipated regional freeway network. The role of transit in the Bay area is viewed as a supplement to the automobile; its primary role is to carry the commuters who would otherwise overload the freeways during peak hours <sup>1/</sup>.

It is important to stress the need for rapid transit as well as for freeways. Today, mass transit - in the form of the Greyhound Bus system and the Key System, imperfect though they may be - does carry about ten percent of all the travelers who might otherwise drive along State Route 206. If it were not for these busses and trains, the traffic flow today on Ashby Avenue, just east of Domingo Road, might be expected to be 27,100 vehicles per day, instead of the actual flow of 24,400. Transit is expected to play an even greater role in the future, as development of the Bay area intensifies. It is expected that after an attractive and effective transit system is in operation, it will carry from 35% to 45% of the East Bay passengers, specifically as follows:

From the East Bay to other East Bay points: 35%  
to San Francisco and Peninsula: 45%  
to Concord and points east of Tunnel: 45%  
to Marin County: 35%

If an overall percentage of East Bay transit patronage of 40% is assumed, we can then estimate what would happen in 1980 if there were no transit. Again, taking Ashby Avenue, just east of Domingo, the 1980 estimated traffic demand, WITH transit, is 69,510 vehicles per day. WITHOUT transit, this demand would then amount to 115,800 vehicles per day. The results mean that WITH transit a six-lane freeway could be expected to handle the traffic, and that WITHOUT transit a ten-lane freeway would be required.

#### Economic Effects of Freeway Construction

A freeway in the general vicinity of State Route 206 will result in measurable benefits and losses to Berkeley residents and the City government. These economic effects are summarized in this section.

Benefits to Users: Freeway-type design provides at least three direct benefits to the driver, compared with travel on City streets; savings in operations costs, savings in time, and savings through accident reduction. The following annual savings to Berkeley residents were computed, using the conservative assumption that Berkeleyans will make 15,000 daily trips, averaging two miles in length, on a State Route 206 Freeway:

(a) Savings in operating costs: computed at \$0.0025 per mile <sup>2/</sup>  
.....\$27,400 per year.

<sup>1/</sup> Berkeley Planning Department, REGIONAL RAPID TRANSIT: BERKELEY AND THE BAY AREA, Berkeley, October 1956

<sup>2/</sup> State Division of Highways, PLANNING MANUAL OF INSTRUCTIONS, VOL. 8.

(b) Savings in driver's time: computed at an average speed of 48 mph on freeways, instead of 18 mph on city streets, and valuing driver's time at 2.6 cents per minute <sup>1/</sup>  
.....\$569,400 per year.

(c) Savings through accident reduction: computed at \$0.006 per mile <sup>2/</sup>  
.....\$65,700 per year.

Total direct benefit to Berkeleyans from these sources: \$662,500 per year.

Tax Loss to Berkeley: Acquisition of private property for a freeway in Berkeley would result in certain direct economic losses to the City treasury. The amount of taxes lost cannot be calculated precisely, but it can be estimated as follows:

a) Loss of Property Tax Revenue: Estimates made in 1952 indicated that approximately \$2,200,000 of assessed value would be removed from the tax rolls if Route A were followed. <sup>3/</sup> Assuming assessed valuation in South Berkeley has increased in the same proportion as in the City as a whole, the present assessed value of property required for Route A would be approximately \$2,440,000. At the 1956-57 City tax rate of \$1.87 per hundred, the direct tax loss would be approximately \$45,600. This represents approximately 1.65% of the total City revenue derived from real and personal property taxes. The \$45,600 tax loss might be also compared with an expected "loss" of \$36,200 when the University of California completes its land-acquisition program near the Campus. <sup>4/</sup>

b) Loss from Other Sources: It may be expected that other sources of City revenue will be affected by the acquisition of land for a freeway, including revenues from sales taxes, business licenses, permits, fines, State subventions, and miscellaneous sources. In 1956-57 the City expects to receive \$3,174,000 from these sources. <sup>5/</sup> Route A of the freeway will displace approximately 1600 persons, or 1.4% of the total City population of 115,000. Assuming the loss is proportional to the population displaced, the loss would be approximately \$44,500.

c) Compensating effects: While direct losses are expected from the sources listed above, this will be offset to some extent by a reduction in the costs of municipal services due to the decreased number of properties. Also, benefits expected from reduction of street congestion and increased communication with the region should result in long-term gains in taxable properties, as explained in the following sections.

<sup>1/</sup> State Division of Highways, PLANNING MANUAL OF INSTRUCTIONS, VOL. 8.

<sup>2/</sup> Ralph A. Moyer, AN ANALYSIS OF HIGHWAY USER BENEFITS ON THE CALIFORNIA INTERSTATE SYSTEM RESULTING FROM COMPLETION OF A 10-YEAR FULL FREEWAY PROGRAM, Institute of Transportation and Traffic Engineering, University of California, May 1955.

<sup>3/</sup> Route A is one of the northernmost of the five routes studied by the Berkeley Dept. of Public Works in 1951-52. It is described more fully on page 16 of this report.

<sup>4/</sup> An estimate prepared in January, 1956 for the Joint University-City Liaison Committee.

<sup>5/</sup> Excluding revenue from parking meters, yacht harbor franchises, garbage and revenue bonds, which will probably be unaffected.

Other Effects of Freeway Construction

Acquisition of Private Property: Any location selected for a freeway in the vicinity of State Route 206 will inevitably result in the acquisition of a considerable amount of private property. Route A, for example, would require the removal of 311 single-family houses, 229 dwelling units in duplexes and apartment structures, 66 retail businesses, 24 warehouse or industrial structures, and 2 institutions, and would require the use of 21 vacant parcels.<sup>1/</sup> As noted earlier, it is estimated that 1600 persons would be displaced. Each parcel acquired would result in considerable inconvenience to the owners or tenants. The State Highway Commission has developed policies which minimize the inconvenience, including ample time periods (usually several years) for owners or tenants to arrange to move. In the great majority of cases, sales for freeway purposes are made by negotiation rather than by condemnation, and the appraised price is based upon recent sales of comparable properties in the immediate vicinity. Once a specific route has been adopted, a fund is made available for advance purchase of properties the owners wish to sell.

Reduction of Street Congestion: Construction of a freeway in an urban area results in a considerable reduction in traffic on parallel surface streets. Heavy traffic volumes, including the larger trucks, find it a great advantage to utilize the freeway route, and surface streets remain for persons living or doing business in the immediate vicinity. Pedestrians find it safer and easier to move throughout the neighborhood and within the local shopping centers. Noise of heavy traffic and trucking is minimized. The need to apply drastic traffic engineering measures <sup>2/</sup> is reduced. Planning measures to stabilize and enhance living environment in residential areas will be more effective.

Communication with the Region: Another important advantage of a freeway on State Route 206 is improved access to other parts of the Bay Area. Bay Area cities are increasingly interdependent, and improved transportation with the region will enhance Berkeley's opportunities for industrial expansion, business development, and cultural advances. With continued growth of the business and industry, Berkeley's long-term tax base will be substantially improved.

Community Disruption: An ill-advised location for a State Route 206 Freeway could result in serious disruption to the community. School service areas, local shopping centers, street patterns, and other public services could be adversely affected. On the other hand, a proper location would minimize any adverse effects. These effects are more fully covered in Part II of this report.

<sup>1/</sup> As noted earlier, all other routes will affect fewer Berkeley properties.  
<sup>2/</sup> e.g. - Parking prohibition, elimination of left turns, conversion of residential streets to one-way arterials, etc.

Properties Adjacent to the Freeway: Another factor which will depend upon freeway location and design is the effect on properties that will remain in residential, business, or industrial use adjacent to the freeway. Here again, these matters are considered more fully in Part II.

Summary of Advantages and Disadvantages

The most significant effects of a freeway on State Route 206 have been described above. The following table summarizes these effects:

SUMMARY TABLE

EFFECTS OF A FREEWAY ON STATE ROUTE 206

ADVANTAGES

1. User benefits estimated annual saving of \$662,500 to Berkeley residents.
2. Reduction of surface street congestion.
3. Improved communication with the region.

DISADVANTAGES

1. Tax loss to the City Treasury, estimated at \$90,100 per year.
2. Inconvenience to owners of properties needed for right-of-way.

EFFECT DEPENDS UPON ROUTE AND DESIGN

1. Disruption of the community.
2. Adverse effects on adjacent property.

The Alternatives Before Us

There appear to be four alternatives for dealing with the problem of mounting traffic congestion on State Route 206:

1. Do nothing.
2. Continue applying traffic engineering measures to the existing surface street system.
3. Widen Ashby Avenue - Tunnel Road to a six-lane surface arterial.
4. Construct a freeway in the vicinity.

Alternatives one and two do not offer any significant relief to present traffic congestion, let alone provide any room for future growth. Plate V compares

present traffic on Ashby Avenue-Tunnel Road with present capacity.<sup>1/</sup> As can be seen, the peak-hour flow now exceeds the capacity in many portions of the route. There is evidence that traffic is even now using parallel streets to avoid congestion on Ashby Avenue. A recent license plate check on Russell Street (from College Avenue to Fulton Street) indicated 27% of the travel consists of "through" trips during the morning peak hour. As congestion on Ashby Avenue mounts, more and more traffic will detour via parallel neighborhood streets and will deteriorate living values and property values. Also, people will experience greater difficulty in reaching central Berkeley, the University, and the industrial area. Drastic traffic engineering measures, such as parallel one-way streets, prohibition of curb parking, and elimination of left-turn movements, cannot provide sufficient capacity for the future volumes expected

Alternative three: A six-lane surface arterial is also an inadequate solution. Experience in other cities has consistently shown that substantial surface street widening without grade separation requires nearly as much property as a freeway, and it is only one-third to one-half as effective in carrying traffic.

Alternative four: Construction of a freeway in the vicinity of Ashby Avenue, appears to be the only solution that will accommodate future traffic demands. Despite the disadvantages of such action, it is the only way to gain the user benefits, keep local south Berkeley streets from becoming saturated with peak-hour traffic, and maintain good communication with all parts of the Bay Area.

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<sup>1/</sup> Capacity is a measure of the ability of a street to safely and conveniently carry traffic and is determined by pavement width, grades, characteristics of traffic, signal timing, etc.

## PART II

If, after a review of the facts and alternatives, Berkeley confirms the present Master Plan conclusion that a freeway is necessary; a specific program for deciding on location and design of a freeway route should be formulated that maximizes benefits and minimizes adverse effects. Part II of this report is concerned with these problems.

### RECOMMENDED CRITERIA FOR FREEWAY LOCATION AND DESIGN

There are two major categories of criteria for determining whether a freeway would maximize benefits and minimize adverse effects. These are (1) LOCATION, i.e., does the freeway go through shopping centers and through neighborhoods, or does it skirt around them? and (2) DESIGN, i.e., will it be of large enough capacity to handle the traffic? Will it be landscaped? Will it be landscaped? Will it be on an elevated fill?

#### Criteria for Route Location

General Limitations: Several factors set the general limits within which it is reasonable to consider locating a possible freeway. These are as follows:

a) Physical Limitations: The ends of the freeway must be considered to be fixed at the Landvale interchange (at the junction of Tunnel Road and Broadway), and at the Ashby Avenue interchange at Eastshore Freeway. There appears to be general acceptance of the eastern terminus, but several alternative proposals have been made for the western end. One of these, that Stanford Avenue and Powell Street in Emeryville be used instead of Ashby Avenue, appears to be unworkable for two reasons: (1) it would not serve Berkeley traffic or north-bound traffic as well as a route further to the north, and (2), the route would approach a duplication of service to be provided by the Grove-Shafter Freeway planned in Oakland.<sup>1</sup>

Shifting the western end of State Route 206 further to the north than Ashby Avenue might be desirable from a traffic point of view. If this were done, it would be most logical to have an interchange at about Dwight Way, or to use the University Avenue interchange. Either of these solutions, however, would so greatly increase the cost and disruption to the community that they must both be ruled out entirely.



This route was also reviewed and eliminated from further consideration in the Planning Commission's 1952 report.

The formation of the hills and the land masses dictates that the possible freeway could go no further north than Tunnel Road, and not much further south than Chabot canyon. It is probable that the freeway should go either in the north, along Tunnel Road, or else to the south, through Chabot canyon, but not between. The intervening Claremont Hill makes a tunnel necessary which would increase costs considerably. (The 1952 studies indicated that a tunnel to accomplish this would cost in the neighborhood of two million dollars)

b) State Legislation: Other factors, not directly concerned with traffic or community planning, have a bearing on the location of the freeway. One of these is that the present legal description of State Route 206 states that it runs along Ashby Avenue and Tunnel Road. To build a freeway in any other location would require an action by the State Legislature. While this is an impediment, it should not be considered as insuperable. It is reasonable to assume that, shown good cause, the State Legislature would change the legal description of the route.

c) City Boundaries: One other factor influencing the location of the freeway is the location of City boundaries. State Route 206 at present runs through the City of Berkeley, and primarily serves traffic moving to and from Berkeley and points north. The location of the freeway will have a profound effect not only on Berkeley, but also on the neighboring cities of Oakland and Emeryville. For this reason, the adjacent cities have an interest in seeing that the best location possible is found for the freeway. It is reasonable to assume that if it becomes clear that the best location for the freeway, from the point of view of all concerned, lies partially outside the present boundaries of Berkeley, that agreement could be reached with neighboring cities. It is also possible that, upon completion of the freeway, some readjustments of the city limits would be desirable; this factor should minimize the importance of observing too rigidly today's boundary lines.

#### Criteria for Route Selection

Service to Traffic: Of primary importance in the location for a proposed freeway is the amount of good it will do to those who use it. This is frequently measured as "user benefits" by computing the amount of time saved by the freeway users and the dollar savings in reduced mileage and operating costs. The advantages to the users of one route over another can be evaluated in this way.

Relationship to the City's Traffic Plan: The on-and-off ramps of a freeway must be well related to the street pattern of the city it passes through. It is of especial importance to see to it that the heavy flows of traffic to and from the freeway uses the streets designed for the heavier traffic. It is undesirable for both the driver and for residents when traffic passes over local residential streets on the way to the freeway.

Relationship to Local Street Pattern: The alignment of a freeway route should be such as to disrupt the local street pattern of a city to a minimum degree possible. It is not desirable to create many dead-end streets, or

diagonal cut-through streets having awkward intersections. Cutting a block diagonally is also undesirable from the economic point of view, as it disturbs more parcels of land than do straight cuts; also, often the remaining parcels of land are so peculiarly shaped as to be virtually unusable.

Relationship to Topography: The topography of the land should be observed. Wherever possible, it is better to avoid hills, rather than cutting through them. Valleys requiring deep fills, should also be avoided where possible.

Cost of Freeway: An obvious criteria is the requirement of minimum cost, consistent with benefits to the users and the community.

Relationship to Neighborhood Patterns: The location of a freeway should be such that it does not disrupt the social patterns of the city through which it passes. Established neighborhoods of a community should, wherever possible, be left undisturbed. Physical barriers, such as freeways, should not come between schools and the children that attend them, between stores and the customers who patronize them, between parks and the people who play there. Also, established shopping centers, schools, churches, and other such features should remain intact if at all feasible.

Relationship to City as a Whole: The freeway should fit into the development of the city, insofar as possible. Consideration should be given to see that the freeway is as positive a benefit to the city, and all its functions, as possible, rather than being just an interrupting feature that must be tolerated.

#### Criteria for Freeway Design

The preceding paragraphs have dealt with a general statement of principles that should be used in locating the route of a freeway. In addition to route selection, the design of the freeway itself is of great concern to the community. A well selected freeway route can still have adverse effects on a community if the design of the freeway is unfortunate. On the other hand, the effect of a poor location can be minimized if the freeway is well designed.

Freeways are tremendously costly investments, and each one built must be of enduring value and usefulness. For this reason high standards are essential. Among the many factors of concern are the following:

Adequate Capacity: The freeway must be adequate to carry the anticipated traffic without overcrowding or congestion.

Adequate Lane Width: Each freeway lane must be wide enough for the free and safe flow of traffic.

Adequate Weaving Distance: "Weaving Distance" for oncoming and off-going traffic of the freeway must be generous enough for safety and convenience.

Adaptable to Stage Construction: The freeway should be designed so that it can be built in stages, and its capacity increased as the traffic demand increases.

Adequate Landscaping: Full landscaping should be provided along the freeway in order to: (a) make the freeway aesthetically acceptable, (b) suppress traffic noises, (c) control the erosion along the freeway cuts and fills, (d) provide for traffic safety by screening the headlights of moving vehicles.

General Appearance: One more factor needs special emphasis. There can be little doubt but that the general appearance of a freeway has a great bearing on the acceptance it gets from the community, and also on the real or imagined property damage it does to the nearby areas of the community. It is of utmost importance that any freeway along State Route 206 be so designed as to be an attractive asset of the community. It would be both needless and most unfortunate if the freeway were to be merely a massive "traffic facility" that would detract from the community. The following features should be incorporated in the design of the freeway:

(a) Moving vehicles should be screened from view of the remaining residential properties; this is especially important in the reduction of headlight glare at night.

(b) Extreme care should be taken to minimize traffic noise by depressing and fully landscaping the route.

(c) The freeway itself, its approaches, and the adjacent lands, must be attractively landscaped, in keeping with the character of the community it passes through.

The foregoing points, emphasizing that the freeway must be both unobtrusive and attractive, indicate that the design of the freeway would be most acceptable if it were built in a depressed cut, with well landscaped embankments on both sides.

Vehicular cross-overs should be provided for all the major and secondary thoroughfares. Pedestrian overpasses should be provided at convenient intervals when necessary. Special care should be taken in the design of the vehicular interchanges to see that, if it is at a point where pedestrian overcrossing is planned, that pedestrians can cross without hazard.

Factors affecting private properties include: (1) No private properties should be left sandwiched between the freeway and its frontage road, (2) No parcel only partially needed should remain if it is less than 5000 feet in area or of an odd or unusable shape, and (3) Properties should not have their yards removed, leaving the structures on substandard lots.

The California State Division of Highways has long been a leader in developing modern freeway standards. These are incorporated in the "Planning Manuals" which summarize State Highway design policies and procedures. Engineering and traffic factors such as lane width, capacity, and weaving distance are fully considered. Other factors, however, are not as fully treated, including land-



scaping, general appearance, and relationships to private properties. Any State Route 206 Freeway must be designed with all the factors enumerated in this section in mind.

#### APPLICATION OF CRITERIA

It is evident that it will be difficult, if not impossible, to meet all the criteria set forth in this report. It is not enough to keep only one or two of the major factors in mind, such as service to traffic alone, or cost of right-of-way alone; all factors listed in this report must be borne in mind, and a reasonable balance made of them all. The traffic service consideration should not dominate the judgment, nor should the cost of right-of-way or construction factor dominate, nor should the effect on the community dominate to the virtual exclusion of all other factors; there must be a reasonable balance of all factors.

#### Analysis of Routes Proposed in 1952.

In January of 1952 five alternative locations were studied by the Berkeley Department of Public Works for State Route 206. In April of 1952 the Berkeley Planning Commission recommended that a sixth route be studied in detail (see Plate V 1). To date, none of these routes has been selected and none has been officially adopted. The five routes suggested by the Department of Public Works are as follows: 1/

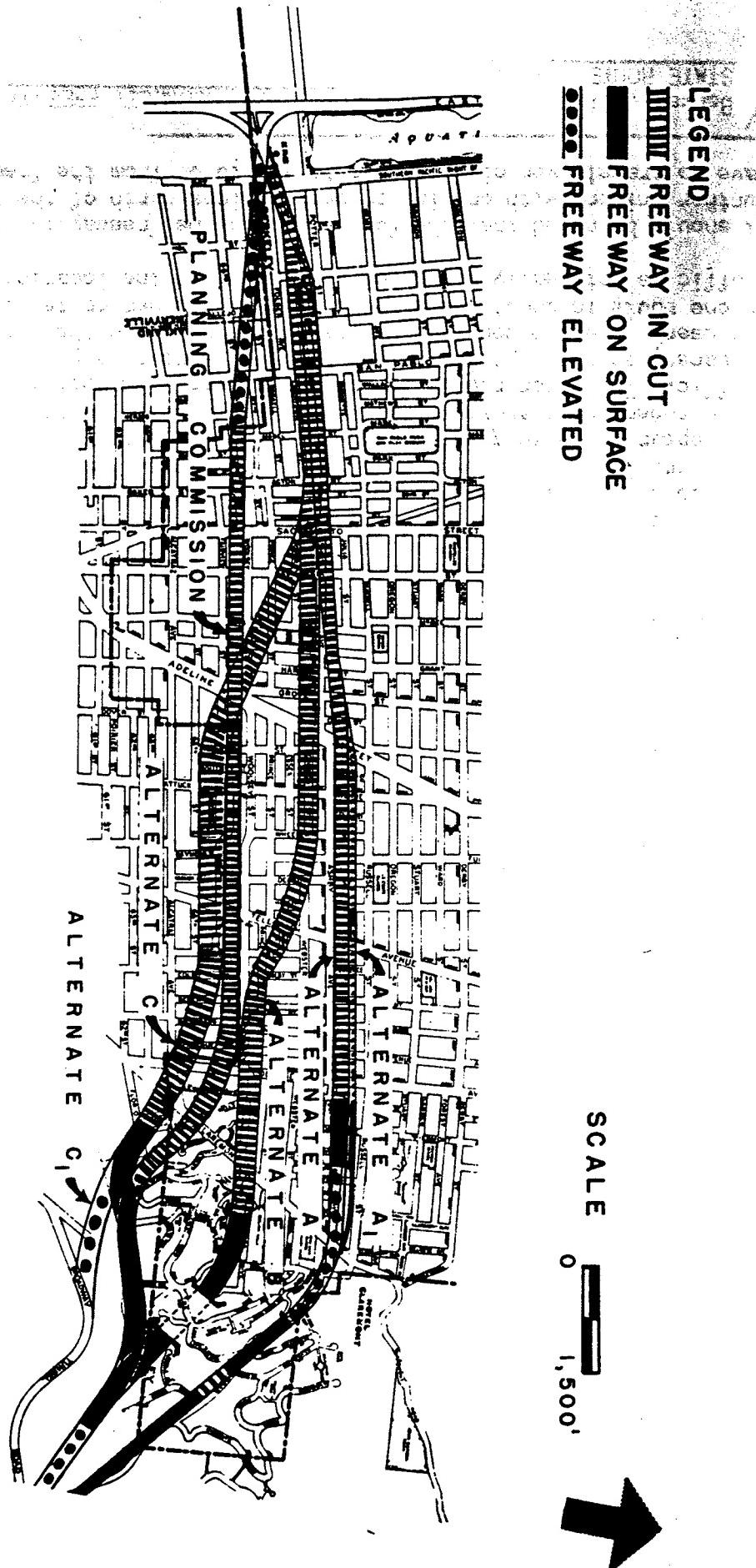
ALTERNATE A: From the Ashby Avenue interchange at Eastshore Freeway along Ashby Avenue to Mabel Street, then along the north side of Ashby Avenue to Claremont Avenue, then along Tunnel Road to the Landvale interchange.

ALTERNATE A-1: Essentially the same as Alternate A, except that the freeway is located a half block further north along Ashby Avenue, permitting the property fronting on Ashby to remain.

ALTERNATE B: From the Ashby Avenue interchange at Eastshore Freeway along Ashby to Mabel Street, then along the south side of Ashby to Adeline Street, then along Emerson Street to Wheeler Street, then in a curving line to Woolsey Street at Regent Street, then along Woolsey to Claremont Avenue, then it runs between Plaza and Parkside Drives to the start of a tunnel beginning at The Plaza. The freeway would pass through the tunnel and emerge about 100 feet west of El Camino, and then curve to the south to follow the Sacramento Northern tracks to the Landvale Intersection.

**PLATE VI**

**FREEWAY ROUTES PROPOSED IN 1952**



ALTERNATE C: From the Ashby Avenue interchange at Eastshore Freeway along Ashby to Mabel Street, then cutting diagonally to the southeast to about Adeline and Fairview Avenue, then parallel to and just south of 66th Street to Regent Street, then diagonally to the southeast to Chabot Road and Ross Street, then along the Sacramento Northern right-of-way to the Landvale intersection.

ALTERNATE C-I: Essentially the same as Alternate C, except that instead of following the Sacramento Northern right-of-way to the Landvale intersection, the route would connect with Broadway at Shafter Avenue.

The route suggested by the Planning Commission in April, 1952 is as follows:<sup>1/</sup>

PLANNING COMMISSION:

From the Ashby Avenue interchange at Eastshore Freeway the route would run diagonally to 66th Street and San Pablo Avenue; it would then run along 66th Street to Woolsey, then along the southern side of Woolsey to about Benvenue; here it would curve diagonally down to Chabot Road at about Chabotyn Terrace, it would then follow Chabot Road to the Sacramento Northern right-of-way and thence to the Landvale intersection.

It would be of value to review the routes proposed in 1952 to see how they meet the criteria for location and design set forth in this report. This review can best be done by considering first the criteria of FREEWAY LOCATION, and then the criteria of FREEWAY DESIGN.

Analysis of 1952 Routes from Point of View of Freeway Location

(a) Service to Traffic: A recent study made by the Planning Department indicates that all of the routes suggested would provide similar service to traffic. In comparison of Alternate A with the Planning Commission Route, it was found that, using 1980 traffic demand, one route would provide 1.4% greater benefit to the users than the other. This does not appear to be so great a difference as to justify saying that one route is so superior to another that it should be selected for reasons of service to traffic. The other routes, for the most part, lie between the two routes compared, so it is probable that they would have very similar services to the users. We can conclude, therefore, that since the service to traffic of one route is about the same as that of another route, that service to traffic is not really a controlling factor in the location of the freeway.

It should be noted that the further south the freeway is located, the further drivers with origins or destinations north of the freeway will have to travel over city streets to get to or from the freeway. The analysis

<sup>1/</sup> Berkeley Planning Commission, PROPOSED BERKELEY FREEWAY STATE ROUTE 206, April, 1952

of the two routes compared (Appendix B) show that the Planning Commission route would save a possible 31,831.50 freeway vehicle miles per day in 1980 over "Alternate A" route. This saving is offset by the fact that the Planning Commission route would require 16,507.00 more city street vehicle miles than would "Alternate A." The savings in freeway vehicle miles would accrue primarily to those who are passing through Berkeley; the additional city street miles would be driven by those with origins or destinations in Berkeley.

(b) Relationship to City's Traffic Plan: The Alternate routes prepared by the Department of Public Works have frontage roads parallel to the Freeway; traffic coming from the freeway moves onto these frontage roads, then to the arterial street system of the city. The end of the off-ramps of the freeway, however, often occurs about midway between the arterial streets in the City of Berkeley. This means that traffic usually would have to drive three or four blocks along the frontage road before coming to an arterial street. The placement of the off-ramps from the freeway routes proposed by the Department of Public Works needs further study.

No on or off ramps or frontage roads were indicated for the freeway route suggested by the Planning Commission; further study is required here also to relate the freeway to the city traffic plan.

It is highly probable that any of the suggested routes could have well-related frontage roads; therefore, we see that this matter is not a controlling factor in the matter of freeway location.

(c) Relationship to the City Street Pattern. Alternate A and A-1 suggested by the Department of Public Works, in which the freeway runs between Ashby and Russell Streets, and then along Tunnel Road, do not disturb the City Street pattern to as great a degree as do some of the other locations. Their major disturbance is that they dead-end all but eleven north-south streets in Berkeley. Russell and Ashby, in addition, are used as frontage roads for the freeway. This would tend to have an unfortunate effect on the properties facing on those streets because it would subject the property to more traffic, and make access to the property more difficult since both Russell and Ashby would be made one-way streets.

Alternates B, C, and C-I in most areas have new frontage roads paralleling the freeway routes; this would minimize the effect of freeway traffic on the city traffic flow. In some areas, however, these routes utilize existing city streets; again, this is not desirable from the point of view of the adjacent property owner. The location of frontage roads needed for the Planning Commission route has not been studied and was not included in the Planning Commission report of 1952.

Each of the suggested freeway routes could have good frontage roads that would be well related to the city street pattern. Again, this is a matter that requires further study before a specific freeway location is selected. It appears to be of such importance as to be an issue that will control the location of the freeway.

(d) Relationship to Topography. Of the five routes suggested by the Department of Public Works, two go along Tunnel Road, two go to the south of the Claremont Hill, and one goes through it. The route that goes through the hill, Alternate B, pays the penalty of fighting topography by having a construction cost which is about \$2,000,000 higher than that for other routes.

(e) Cost of Right-of-Way. The cost estimates for the right-of-way for the five routes studied by the Department of Public Works in 1952 are as follows:

<u>Route</u>	<u>Cost in Millions</u>	<u>Relative Cost</u>
A	\$ 8.96	99.8
A-1	8.26	92.0
B	7.43	82.7
C	8.98	100.00
C-1	8.89	98.9

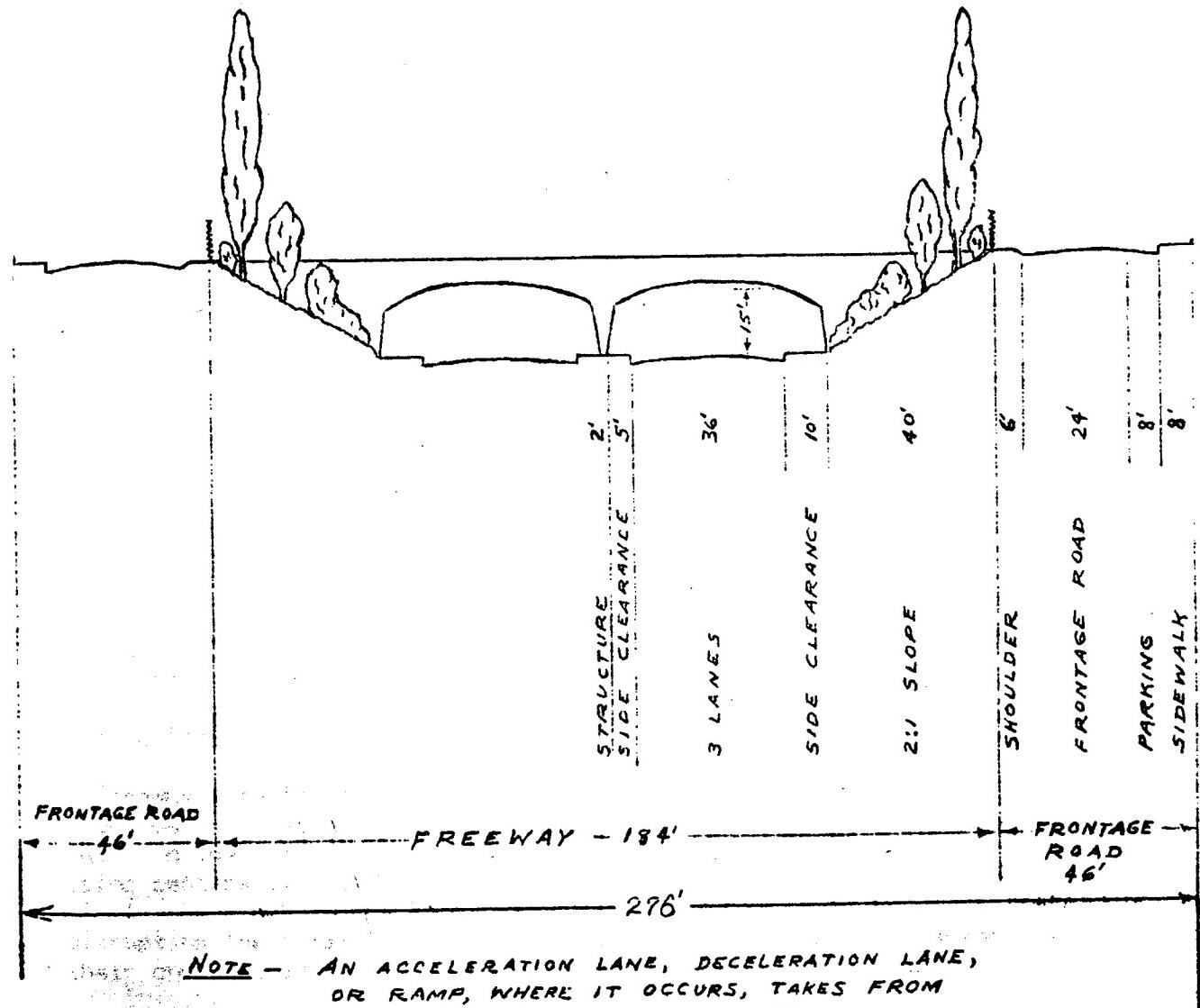
It will be noted from the above table that the most expensive right-of-way (C) is the one which cuts diagonally across the greatest number of properties. Also, the cheapest right-of-way (B) is the one which runs through the most rugged topography. It is cheaper by \$830,000 than the next lowest priced right-of-way. This saving, however, is more than wiped out by more construction costs (see the following section). It should be further noted that the costs given above were estimated in 1952, and were for a right-of-way which was from about 120 to 230 feet in width. 1957 land costs are higher than those of 1952, and present day engineering standards call for a right-of-way of from 184 to 276 feet, therefore it can be seen that 1957 costs will be considerably above those estimated for 1952. See Plate VII for an illustration of a typical freeway cross-section, using current design standards.

No cost estimates have been made for the Planning Commission route; it is probable, however, that its costs would lie somewhere between the cost of the Department of Public Works Route C and Route A-1.

The cost of right-of-way is an important item in selecting the location for a freeway. Nevertheless, the price differences between one right-of-way and another are not so great as to dictate a single location. Therefore, it can be said that the price of the right-of-way is not a controlling factor.

(f) Cost of Construction. The construction cost estimates for the five routes studied by the Department of Public Works in 1952 are as follows:

PLATE VII  
CROSS SECTION OF SIX LANE FREEWAY



NOTE — AN ACCELERATION LANE, DECELERATION LANE, OR RAMP, WHERE IT OCCURS, TAKES FROM 0 TO 28 FEET ADDITIONAL WIDTH.

Source: Measurements derived from design standards set forth in PLANNING MANUAL OF INSTRUCTIONS, VOLUME 8, by the State Division of Highways, 1956 edition.

<u>Route</u>	<u>Cost in Millions</u>	<u>Relative Cost</u>
A	\$ 5.9	74
A-1	5.9	74
B	8.0	100
C	5.5	69
C-1	5.7	71

Route B, which involves a tunnel, has a construction cost of \$2.1 million dollars more than the next most costly route. The other routes were Tunnel Road and Ashby Avenue (Routes A and A-1) or a more southern route (C or C-1); the costs of these vary by approximately 7%. No figures are available concerning the cost of construction of the Planning Commission route.

The cost of construction does seem to be a controlling factor in selecting a location for a freeway, in that it would be unreasonable to select a route involving a two million dollar higher price, unless there were obvious counter-balancing factors to the contrary. However, it is evident that if we rule out routes involving tunnels, that all the other routes are fairly close in price; that in this event construction cost no longer is a controlling factor in freeway location in Berkeley.

#### Relationship to Neighborhood Patterns

Before an analysis can be made of how a freeway would disrupt the neighborhood patterns in a community, these neighborhood patterns must be clearly understood. The important patterns include the relationship of residents and the stores where they trade, the ties of one neighbor to another, the relationship of people to their schools, churches, and to other social institutions.

If a freeway were located along Ashby Avenue and Tunnel Road, would it cause more or less disruption to neighborhood patterns than a freeway along Woolsey Street? In the first instance, because the freeway would pass through four shopping centers it would interfere with the established relationship of people to the stores where they trade. In the second instance, it might be disrupting the relationship of one neighbor to another, of the residents to their churches and schools. Where would the least harm be done?

There is no accepted method of assigning dollar values to the amount of damage or benefit a freeway does to neighborhood patterns. The importance of human values, however, should not be underestimated.

The Berkeley Master Plan indicates the general neighborhood organization of the city, but does not go into specific detail on the relation to adjacent Oakland neighborhoods. At the time of publication of the Master Plan, it was recognized that more detailed studies would have to be made at a later date.

The effect of freeway location on neighborhood patterns is of importance, and it is probably of such importance as to be a controlling factor in the selection of a specific freeway route. It has been studied to such a minor degree, however, that no conclusions can be reached at this time.

#### Review of Proposed Routes, based on Design Criteria

For the most part, design factors will have little influence on the location of a freeway in Berkeley. No matter where it is built, it must be designed to meet minimum standards for land width, landscaping, number of lanes, and so on. One design factor, however, may have a controlling influence on the location of the freeway. This is the matter of whether the freeway is elevated on a fill, whether it runs along the surface of the earth, or whether it is in a depressed cut.

A review of the specific freeway designs studied in 1952 reveals the following:

Capacity: The five routes studied by the Department of Public Works all indicate a four lane freeway, with room for an additional two lanes at a later date. The Planning Commission did not specify the size of the freeway. Latest information on the capacity needed, indicates that at least six lanes will be required to meet the traffic demand.

Lane Width: The Department of Public Works studies recommended 12 foot lanes; the Planning Commission gave no specifications. Twelve foot lanes are the current standard for freeway construction.

Weaving Distance: The Department of Public Works specified a desirable minimum weaving distance of 800 feet. The Planning Commission made no recommendations.

The State Division of Highways currently uses a fairly complex method of computing weaving distances (using a formula which takes into account the number of cars weaving, and the speeds of the cars). It is impossible to compute the precise desirable weaving distances today without going into expected traffic characteristics; the flat 800 feet figure appears to be not applicable today.

Stage Construction: The Department of Public Works specifically planned their routes for stage construction; the Planning Commission specified that the freeway "must be capable of stage construction."

Landscaping: The Department of Public Works report mentions that "The freeway should be depressed from Mabel Street to the College-Domingo area, and have open, planted slopes wherever possible;" <sup>1/</sup> other than this, little reference is made to landscaping. The Planning Commission, in its report,

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Richard Gallagher, Crosstown Freeway Study, page 10

put stress on the visual aspects of the freeway design, and included the following as one of its six major design considerations: "The freeway should be built on parkway principles with right-of-way sufficient to permit full landscaping." 1/

Vehicular Crossovers: The Department of Public Works specified grade separations at Sacramento, Grove, Adeline, Shattuck, Telegraph, College, and Claremont, with pedestrian overpasses "where necessary." The Planning Commission made no specifications. With the adoption of the Berkeley Master Plan, it is clear that the streets named by the Department of Public Works are the appropriate ones for grade separations, plus San Pablo Avenue and Seventh Street, which were not included in the original study by the Department of Public Works.

Relationship to Private Properties: (a) Sandwiching of private property between the freeway and its frontage roads: Here is the ground for one of the severest criticisms of the Department of Public Works studies. Routes A and A-1 both use Russell and Ashby as frontage roads, and thereby sandwich many houses. Routes B, C, and C-1 do not sandwich any houses. The Planning Commission Route does not specify the location of frontage roads, so its sandwiching effect cannot be determined at this time; (b) Reduction in lot size to below 5000 square feet, or to unusable shapes: The Department of Public Works shows specific design for one route only, A-1. In the design of this route, many instances of cutting lots to substandard size occur, remaining parcels of land are often unusable in size or shape, and many houses are shorn of their rear or side yards. It is apparent from the general appearance of the design studies that similar treatment was anticipated along other routes. From the design criteria set forth in this report, the details shown in this report, the details shown in the Public Works designs would be unacceptable to the community. The Planning Commission route has not been presented in detail sufficient to judge this issue.

#### Review of the Controlling Factors in Freeway Location

The following factors were determined to be most important in the selection of a route for State Route 206:

1. The ends of the freeway can be considered fixed. The termini are at the Ashby Avenue interchange with the Eastshore freeway, and at the Landvale interchange (the junction of Tunnel Road and the Broadway Tunnel Road).

2. For topographical reasons, the freeway must run either along Tunnel Road, or to the south of the Claremont Hill.

3. The relationship of the freeway route to the City street pattern is of importance. Routes which cut diagonally across city blocks or which dead-end many streets should be avoided. Access roads and service roads for the freeway will have a profound effect on the properties adjacent to the freeway. These are matters which should be studied in detail before a specific freeway route is selected.

1/

4. The disruption of neighborhood patterns in the City of Berkeley and of Oakland is of serious concern. The location of the freeway will have a profound effect on the lives of many people; this effect cannot be directly measured in dollars and cents.

5. The specific design of the freeway is of great importance; a freeway in a depressed cut would be less objectionable than one on an elevated fill. The design of the overpass structures, the landscaping of the right-of-way, and other visual aspects of the freeway design all have a strong bearing on the acceptability of a freeway; these are matters that should be reviewed in detail before a specific route is selected.

Other factors, such as right-of-way cost, lane width, user benefits, and construction cost do not appear to control the location of the route. They are important, but they do not vary to such a degree from one route to another to control the location.

### Conclusions

It is apparent from a review of the five alternate routes studied by the Department of Public Works, and the one route proposed by the Planning Commission, that none of them have been studied to such a degree that a decision about any of them could be reached at this time.

The Public Works routes have not been designed to thoroughly consider such factors as the disruption of the community, nor the effect of the freeway on adjacent properties. The Planning Commission route has not been studied from the engineering standpoint.

Whichever route is finally selected should be chosen on the basis of how it compares with other routes in meeting the five controlling factors listed above. As of this date, neither planning nor engineering studies have been pursued to such a degree that a fair evaluation of the routes could be made.